

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (currently amended) A method of automatically configuring a network device, the method
2 comprising the computer-implemented steps of:
3 receiving a request from the network device to provide configuration information;
4 retrieving a template describing a device configuration, wherein the template
5 comprises ~~zero~~ one or more parameters that may receive values specific to a
6 particular device;
7 retrieving ~~zero~~ one or more values of parameters specific to the device;
8 creating and storing a device-specific instance of the configuration information based
9 on the template and the values of parameters ~~and~~; said configuration
10 information conforming to an Extensible Markup Language Document Type
11 Definition (XML DTD)[,] and comprising one or more XML tags that delimit
12 a beginning and an ending of the configuration information.

1 2. (original) A method as recited in Claim 1, further comprising the steps of:
2 testing the configuration information to determine whether it is well-formed with
3 respect to the XML DTD;
4 providing the configuration information to the network device.

1 3. (currently amended) A method as recited in Claim 1, further comprising the steps of:
2 testing the configuration information to determine whether it is well-formed with
3 respect to the XML DTD;
4 providing the configuration information to the network device over a reliable
5 transport protocol ~~that assures~~, wherein the network device ensures that all of

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6 the ~~entire~~ configuration information is received by checking the one or more
7 XML tags that delimit a beginning and an ending of configuration information
8 ~~received at the network device.~~

1 4. (currently amended) A method as recited in Claim 1, further comprising the steps of:

2 providing the configuration information to the network device; and
3 at the network device,

4 syntax checking the configuration information to determine whether
5 configuration commands therein conform to a command language that is
6 understood by the network device;
7 applying the configuration information to the network device.

1 5. (currently amended) A method as recited in Claim 1, further comprising the steps of:

2 providing the configuration information to the network device; and
3 at the network device,

4 syntax checking the configuration information to determine whether
5 configuration commands therein conform to a command language that is
6 understood by the network device;
7 applying the configuration information to the network device;
8 when a syntax error is detected during the syntax checking step, publishing an
9 event that reports the syntax error using an event service.

1 6. (original) A method as recited in Claim 1, further comprising the steps of:

2 providing the configuration information to a plurality of network devices;
3 at one of the network devices, syntax checking the configuration information to
4 determine whether configuration commands therein conform to a command
5 language that is understood by the network device;
6 upon successful syntax checking, generating an event to an event service to which the
7 plurality of network devices subscribe, wherein the event announces that the
8 configuration commands conform to correct syntax;

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9 in response to receiving the event, applying the configuration information to the
10 network devices concurrently.

1 7. (original) A method as recited in Claim 1, further comprising the steps of:
2 providing the configuration information to a plurality of network devices;
3 upon successfully receiving the configuration information at one of the network
4 devices, generating an event to an event service to which the plurality of
5 network devices subscribe;
6 in response to receiving the event, applying the configuration information to the
7 network devices concurrently.

1 8. (original) A method as recited in Claim 1, further comprising the steps of:
2 applying the configuration information to the network device;
3 receiving a user request to cancel application of the configuration information;
4 restoring the network device to its state prior to application of the configuration
5 information.

1 9. (original) A method as recited in Claim 1, wherein the step of receiving a request from the
2 network device to provide configuration information comprises the step of receiving an
3 HTTP request that identifies a configuration service that can provide the configuration
4 information and that includes a unique identifier of the network device.

1 10. (original) A method as recited in Claim 1, wherein the step of receiving a request from
2 the network device to provide configuration information comprises the step of receiving an
3 HTTP request that identifies an Active Server Page of a configuration service that can
4 provide the configuration information and that includes a unique identifier of the network
5 device.

1 11. (original) A method as recited in Claim 1, wherein the step of receiving a request from
2 the network device to provide configuration information comprises the step of receiving an

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3 HTTP request that identifies a Java® Servlet of a configuration service that can provide the
4 configuration information and that includes a unique identifier of the network device.

1 12. (currently amended) A method as recited in Claim 1, wherein the step of ~~receiving~~
2 retrieving a template comprises the step of retrieving a template describing the configuration
3 information, wherein the template comprises ~~zero~~ one or more parameters that may receive
4 values specific to a particular device, and wherein the step of receiving ~~zero~~ one or more
5 values of parameters specific to the device comprises the step of retrieving a container object
6 associated with the network device from the directory and obtaining the values of parameters
7 from directory objects contained within the container object.

1 13. (currently amended) A method as recited in Claim 1, wherein the step of ~~receiving~~
2 retrieving a template comprises the steps of:
3 retrieving a reference to a template describing the configuration information from a
4 directory service;
5 retrieving the template from a configuration server based on the ~~received~~ retrieved
6 reference, wherein the template comprises ~~zero~~ one or more parameters that
7 may receive values specific to a particular device, and wherein the step of
8 receiving ~~zero~~ one or more values of parameters specific to the device
9 comprises the step of retrieving a container object associated with the network
10 device from the directory and obtaining the values of parameters from
11 directory objects contained within the container object.

1 14. (original) A method as recited in Claim 5, wherein the step of syntax checking comprises
2 parsing one or more configuration commands within the configuration information using a
3 parser of an operating system that is executed by the network device.

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1 15. (currently amended) The method as recited in Claim 1, further comprising the steps of:
2 determining that a partial configuration should be sent to one or more network
3 devices;
4 based on the template and the ~~zero~~ one or more values of parameters specific to the
5 device, creating and storing a device-specific instance of the partial
6 configuration based on the template and the values of parameters and
7 conforming to an Extensible Markup Language Document Type Definition
8 (XML DTD), comprising one or more XML tags that delimit the partial
9 configuration;
10 publishing the partial configuration to an event service that is communicatively
11 coupled to the network devices.

1 16. (currently amended) The method as recited in Claim 1, further comprising the steps of:
2 determining that a partial configuration should be sent to one or more network
3 devices;
4 based on the template and the ~~zero~~ one or more values of parameters specific to the
5 device, creating and storing a device-specific instance of the partial
6 configuration based on the template and the values of parameters and
7 conforming to an Extensible Markup Language Document Type Definition
8 (XML DTD), comprising one or more XML tags that delimit the partial
9 configuration;
10 publishing a partial configuration trigger event to an event service that is
11 communicatively coupled to the network devices; and
12 providing the partial configuration to one or more network devices in response to
13 requests therefrom that are received in response to the trigger event.

1 17. (currently amended) A method of automatically configuring a network device, the
2 method comprising the computer-implemented steps of:
3 generating a request to provide configuration information;

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4 receiving a set of configuration information conforming to an Extensible Markup
5 Language Document Type Definition (XML DTD), the configuration
6 information comprising one or more XML tags that delimit a beginning and
7 an end of the configuration information, said set of configuration information
8 based on a template describing a device configuration that is instantiated with
9 ~~zero~~ one or more parameter values that are specific to the network device;
10 syntax checking the configuration information to determine whether configuration
11 commands therein conform to a command language that is understood by the
12 network device;
13 applying the configuration information to the network device.

1 18. (original) A method as recited in Claim 17, wherein the set of configuration information
2 is received concurrently at a plurality of network devices, and further comprising the
3 steps of:
4 at one of the network devices, syntax checking the configuration information to
5 determine whether configuration commands therein conform to a command
6 language that is understood by the network device;
7 upon successful syntax checking, generating a status event to an event service to
8 which the plurality of network devices subscribe, wherein the status event
9 announces that the configuration commands conform to correct syntax;
10 in response to receiving a "write" event, applying the configuration information to the
11 network device.

1 19. (original) A method as recited in Claim 17, wherein the step of generating a request to
2 provide configuration information comprises the step of generating an HTTP request
3 that identifies a configuration service that can provide the configuration information
4 and that includes a unique identifier of the network device.

1 20. (original) A method as recited in Claim 17, wherein the step of generating a request to
2 provide configuration information comprises the step of generating an HTTP request

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3 that identifies an Active Server Page of a configuration service that can provide the
4 configuration information and that includes a unique identifier of the network device.

1 21. (original) A method as recited in Claim 17, wherein the step of generating a request to
2 provide configuration information comprises the step of generating an HTTP request
3 that identifies a Java® Servlet of a configuration service that can provide the
4 configuration information and that includes a unique identifier of the network device.

1 22. (currently amended) A method as recited in Claim 17, wherein the step of receiving a set
2 of configuration information comprises the steps of, at a configuration server,
3 receiving a template describing the device configuration from a directory service,
4 wherein the template comprises ~~zero~~ one or more parameters that may receive values
5 specific to a particular device, and wherein the step of receiving ~~zero~~ one or more
6 values of parameters specific to the device comprises the step of retrieving a
7 container object associated with the network device from the directory and obtaining
8 the values of parameters from directory objects contained within the container object.

1 23. (original) A method as recited in Claim 17, wherein the step of syntax checking
2 comprises applying the configuration commands to a parser of an operating system
3 that is executed by the network device.

1 24. (currently amended) An apparatus for automatically configuring a network device,
2 comprising:
3 a configuration service configured for carrying out the steps of:
4 receiving, from a configuration agent executed by the network device, a
5 request to provide configuration information;
6 retrieving a template describing a device configuration, wherein the template
7 comprises ~~zero~~ one or more parameters that may be resolved into
8 values specific to a particular device;
9 retrieving ~~zero~~ one or more values of parameters specific to the device;

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10 creating and storing a device-specific instance of the configuration
11 information based on the template and the values of parameters and
12 conforming to an Extensible Markup Language Document Type
13 Definition (XML DTD), comprising one or more XML tags that
14 delimit the configuration information, including at least one pair of
15 XML tags that delimit a beginning and an end of the configuration
16 information.

1 25. (currently amended) An apparatus as recited in Claim 24, further comprising:
2 one or more configuration templates stored in a directory service, wherein each of the
3 configuration templates comprises an object in the directory service that
4 describes the device configuration, and wherein the template comprises ~~zero~~
5 one or more parameters that may receive values specific to a particular device;
6 one or more container objects stored in the directory service and associated with the
7 network device, each of the container objects comprising values for the ~~zero~~
8 one or more parameters in one of the configuration templates that corresponds
9 to the network device.

1 26. (currently amended) A computer-readable medium carrying one or more sequences of
2 instructions for automatically configuring a network device, which instructions, when
3 executed by one or more processors, cause the one or more processors to carry out the steps
4 of:
5 receiving a request from the network device to provide configuration information;
6 retrieving a template describing a device configuration, wherein the template
7 comprises ~~zero~~ one or more parameters that may be resolved into values
8 specific to a particular device;
9 retrieving ~~zero~~ one or more values of parameters specific to the device;
10 creating and storing a device-specific instance of the configuration
11 information based on the template and the values of parameters and
12 conforming to an Extensible Markup Language Document Type
13 Definition (XML DTD), comprising one or more XML tags that

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14 delimit the configuration information, including at least one pair of
15 XML tags that delimit a beginning and an end of the configuration
16 information.

1 27. (currently amended) An apparatus for automatically configuring a network device,
2 comprising:
3 means for receiving a request from the network device to provide configuration
4 information;
5 means for retrieving a template describing a device configuration, wherein the
6 template comprises ~~zero~~ one or more parameters that may be resolved into
7 values specific to a particular device;
8 means for retrieving ~~zero~~ one or more values of parameters specific to the device;
9 means for creating and storing a device-specific instance of the configuration
10 information based on the template and the values of parameters and
11 conforming to an Extensible Markup Language Document Type
12 Definition (XML DTD), comprising one or more XML tags that
13 delimit the configuration information, including at least one pair of
14 XML tags that delimit a beginning and an end of the configuration
15 information.

1 28. (currently amended) An apparatus for automatically configuring a network device,
2 comprising:
3 a network interface that is coupled to ~~the~~ a data network for receiving one or more
4 packet flows therefrom;
5 a processor;
6 one or more stored sequences of instructions which, when executed by the processor,
7 cause the processor to carry out the steps of:
8 generating a request to provide configuration information;
9 retrieving a set of configuration information conforming to an Extensible Markup
10 Language Document Type Definition (XML DTD), the configuration
11 information comprising one or more XML tags that delimit a beginning and

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12 an end of the configuration information, based on a template describing a
13 device configuration that is instantiated with ~~zero~~ one or more parameter
14 values that are specific to the network device;
15 syntax checking the configuration information to determine whether configuration
16 commands therein conform to a command language that is understood by the
17 network device;
18 applying the configuration information to the network device.

1 29. (original) An apparatus as recited in Claim 28, wherein the step of syntax checking
2 comprises the steps of determining whether the set of configuration information is well
3 formed with respect to XML; determining whether the set of configuration information
4 conforms to correct XML syntax; and determining whether the configuration commands
5 conform to correct command language syntax.

1 30. (currently amended) An apparatus for automatically configuring a network device,
2 comprising:
3 a configuration agent executed by the network device and configured for carrying out
4 the steps of:
5 generating a request to provide configuration information;
6 receiving a device-specific instance of configuration information based on a
7 template describing a device configuration, wherein the template
8 comprises ~~zero~~ one or more parameters that may be resolved into
9 values specific to a particular device, and based on ~~zero~~ one or more
10 values of parameters specific to the device that are received from a
11 repository, and wherein the template conforms to an Extensible
12 Markup Language Document Type Definition (XML DTD),
13 comprising one or more XML tags that delimit a beginning and an end
14 of the configuration information;
15 applying the configuration information to the network device to result in re-
16 configuring the network device in accordance with the template.

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1 31. (currently amended) An apparatus as recited in Claim 30, further comprising:
2 one or more configuration templates stored in a directory service, wherein each of the
3 configuration templates comprises an object in the directory service that
4 describes the device configuration, and wherein the template comprises ~~zero~~
5 one or more parameters that may receive values specific to a particular device;
6 one or more container objects stored in the directory service and associated with the
7 network device, each of the container objects comprising values for the ~~zero~~
8 one or more parameters in one of the configuration templates that corresponds
9 to the network device.

1 32. (currently amended) A method of automatically configuring a computer program
2 application that uses information about network devices or topology in order to operate in a
3 network environment, comprising the steps of:
4 receiving a request for network topology information from the computer program
5 application;
6 retrieving a template of network topology information from a repository;
7 resolving elements of the topology into application-specific values, resulting in
8 creating and storing resolved topology information;
9 providing the resolved ~~configuration~~ network topology information to a configuration
10 agent within the application that is configured to re-configure the computer
11 program application to operate with the resolved network topology ~~then-~~
12 ~~current network configuration~~.

1 33. (original) A method as recited in Claim 32, wherein resolving elements of the topology
2 includes the step of carrying out application-specific syntax checking of elements of
3 the template.